REPLENISHMENT-AT-SEA SHIPS.— *Replenishment* at *sea* is the term applied to the transfer of fuel, munitions, supplies, and personnel from one vessel to another while ships are under way. During World War II, replenishment at sea (fig. 8-32) was developed to a fine art of seamanship, which is taken as a matter of course today.

Replenishment at sea is accomplished with both the replenishment ship and the ship(s) being replenished steaming side by side on parallel courses at a

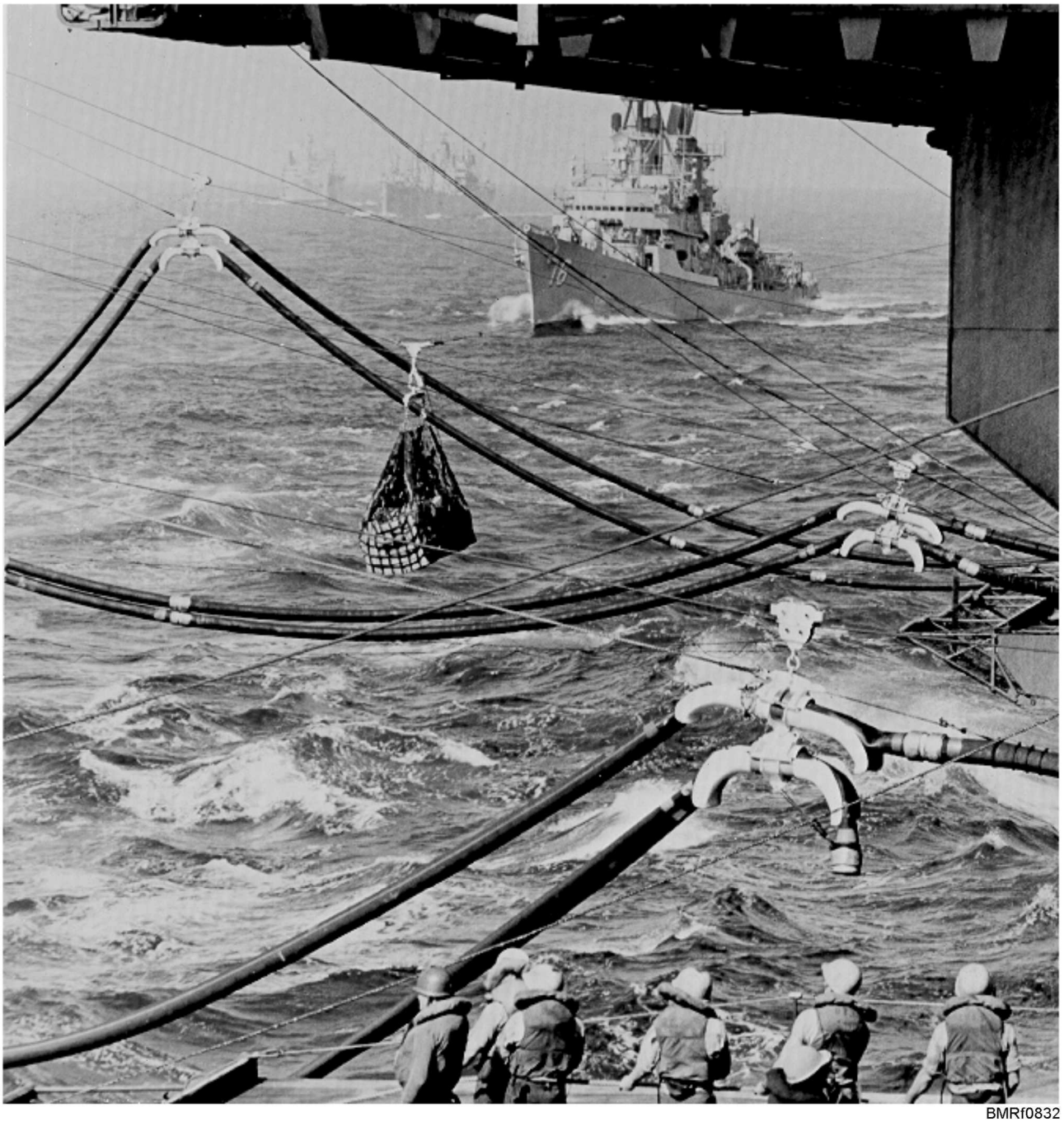

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Figure 8-32.—Replenishment at sea enables the fleet to remain at sea and make successive strikes without returning to base for fuel, ammunition, and supplies.

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predetermined speed. In most cases, the replenishment ship maintains its course and speed while the other ship(s) maneuver(s) into position alongside. A separation of about 100 feet is maintained between ships, with the replenishing ship frequently serving ships both to port and starboard. Messenger lines are passed to the receiving ships, which send back telephone and distance measuring lines and then haul over cargo-handling gear or fuel hoses by means of the messengers.

Ships designed for that purpose do most of the replenishment, but major combatant ships are capable of refueling smaller ships. Even the smallest ships can, and do, transfer light freight, mail, and personnel by means of highlines.

In addition to the standard replenishment capabilities, all recently constructed, as well as many of the older auxiliary, ships have helicopter platforms for the transfer of munitions, personnel, cargo, and stores by vertical replenishment. Vertical replenishment permits a receiving ship to remain on station in combat formation, eliminating the necessity of temporarily immobilizing itself by going alongside another ship for replenishment.

Ammunition Ships.—Ammunition ships (AEs) (fig. 8-33) operate with replenishment groups to deliver ammunition and missiles to the fleet at sea. Their design incorporates a mechanical handling system for more rapid loading and off-loading of ammunition. The mechanical handling system includes such equipment as dual-cantilevered elevators in the holds; forklift trucks; and low-lift, power-operated transporters on the main deck for handling palletized ammunition from the elevators to the transfer stations. Universal portable metal dunnage provides maximum stowage with ready access to all types of ammunition. A tension highline system is built into the design along with new, improved electro-hydraulic cargo winches for replenishment at sea. These improvements provide for much more rapid and reliable transfers and conservation of deck space. These ships are capable of handling all types of missiles (fig. 8-34).

Oilers and Tankers.—Oilers (AOs), carrying Navy fuel oil, jet fuel, and other petroleum products, operate with replenishment groups and deliver their cargo to ships at sea. Oilers, as well as ammunition ships (fig. 8-35), can service ships on both sides simultaneously.

The AO (Jumbo) is a conversion of the AO that includes the installation of a new midsection in the hull. This midsection increases the payload and provides for an improved balance of cargo fuel products to meet the more recent demands placed upon the AO by the increase in fleet requirements for jet aircraft fuel.

Photograph courtesy of PH3 Jason Branson

Figure 8-33.—USS *John C. Stennis* (CVN 74) off-loads ammunition onto ammunition ship USS *Mount Hood* (AE 29).

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Figure 8-34.—An AE highlines a missile to a guided-missile ship during replenishment at sea.

Fast Combat Support Ships.—The fast combat support ship (AOE) is the largest and most powerful auxiliary ship in the Navy. Unlike other replenishment ships, the AOE is designed to operate as an integral force rather than as a unit of an underway replenishment group.

The AOE (fig. 8-36) is a multiple-product ship (missiles, fuel, ammunition, and general cargo) that has a cargo-fuel capacity greater than that of our largest fleet oilers plus a hold capacity equal to the largest ammunition ship. In addition, the ship carries a large load of both general supplies, materials, and refrigerated cargo.

Other than speed and capacity, this ship has two major areas of improvement over other replenishment vessels—material handling and replenishment at sea. Materials, other than missiles and special weapons, are moved vertically by elevators or conveyors. Horizontal movement of general cargo and ammunition is mechanized through the use of pallet transporters and forklift trucks. Cargo helicopters are available to

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Figure 8-35.—AOE conducting an evolution.

Figure 8-36.—A multiple-product AOE conducting under way replenishment.